

which has accomplished so much in more material ways, has been employed, and men who have attained eminence in special fields, unite in writing a book which, when complete, embodies the most advanced ideas of the best practitioners of the day.

The American systems of obstetrics, of gynæcology and of surgery, which are already well known and widely used among the profession, are good examples of this type of work, and this latest bidder for popular favor is sure soon to take its place by their side.

H. P. DE FOREST.

NUEVA CONCEPCIÓN DE LA HISTOLOGIA DE LOS CENTROS NERVIOSOS.

Por el DR. D. SANTIAGO RAMON Y CAJAL. Conferencias pronunciadas en la Academia y Laboratorio de Ciencias Medicas de Cataluna. March 14, 18, 19, 1892, Barcelona, 1893. ("New conception of the histology of the nervous centres.")

This *brochure* in Spanish, reprinted from the *Revista de Ciencias Medicas*, of Barcelona, contains in three lectures a statement of the results of the comparatively recent investigations that have, in some respects, rather revolutionized our ideas on the finer structure of the nervous centres. The author speaks with authority, since his personal labors have contributed no small part, if not, indeed, the greater part, to these results. The general conclusion of his lectures as given are of interest, as his own statements of these important contributions to our knowledge. Stated briefly they are as follows:

(1) The most general conclusion relative to the morphology of the cells of the centres is the absence of substantial continuity between the expansions of the nervous, epithelial, and neuroglia corpuscles. The nervous elements represent true cellular unities, or *neuronas*, to use Waldeyer's term.

(2) There being no substantial continuity, the currents must com-

municate from one cell to another by contiguity or contact. This contact takes place between the terminal or collateral arborizations of the cylinder axes on the one hand, and the cell bodies and protoplasmic arborizations on the other. When, as happens in some cases, these protoplasmic expansions are lacking, the cellular superficies is the only part to which the nervous arborizations are applied.

(3) The probable direction of the nervous conditions in the cells which possess both kinds of expansions is cellulipetal in the protoplasmic expansions, and cellulifugal in the cylinder axes.

(4) In the bipolar cells (acoustics, olfactory, retinal, etc.) the peripheral expansion is coarse, and should be considered as of protoplasmic significance, being destined to collect the currents (cellulipetal).

(5) The protoplasmic expansions are not mere nutritive apparatuses, as has been held by Golgi, a sort of channel for the plasma exuded from the capillaries, as they have a conductive function the same as the cylinder axes. The asserted facts invoked in favor of this theory, the grouping of the protoplasmic expansions around the vessels, and their connection with the neuralgia cells have been confined to Cajal, Lenhössek, Van Gehuchten, Kolliker, Retzius, Schaefer, etc.

(6) The extreme length of certain protoplasmic processes (pyramidal cells of brain, Purkinje cells, etc.), as also the richness of the lateral and basilar protoplasmic expansions, seem to bear a relation with the number of nervous arborizations, the currents of which they receive. The interspinous roughnesses, etc., exhibited by many protoplasmic arborizations, probably represent the places of impression or contact of the terminal nervous fibres.

These conclusions are given more in detail than as stated here, and are supported by various facts of human and comparative anatomy. They are given here in brief as an authoritative statement of the principal results of these very recent and important researches, by one of the chief of the investigators, to whose labors we owe them. For a full statement of these facts we must refer the reader

to the work itself, or the similar general statements of Lenhossek and others.

It is a noteworthy fact that Spain, a country that has for a long time been less active in scientific matters than perhaps most other European nations, has come to the fore in these discoveries by the works of the author of these lectures.

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